

On the Pteromaline of the Hessian Fly.

By Prof. K. LINDEMAN.

Prof. Lindeman has laid before the Society of Naturalists of Moscow an interesting account of the Pteromaline parasites which he has bred from puparia of the Hessian fly obtained from various parts of Russia. He contrasts the species observed by him with those recorded by Riley † in North America, as follows:—

In North America.

In Russia.

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| 1. <i>Merisus destructor</i> , Say. { | 1. <i>Merisus intermedius</i> , Lind. |
| 2. — subapterus, Ril. { | 2. <i>Tetrastichus Rileyi</i> , Lind. |
| 3. <i>Tetrastichus productus</i> , Ril. | 3. <i>Eupelmus Karschii</i> , Lind. |
| 4. <i>Eupelmus Allynii</i> , French. | 4. <i>Platygaster minutus</i> , Lind. |
| 5. <i>Platygaster Herrickii</i> , Pack. | 5. <i>Semiotellus nigripes</i> , Lind. |
| | 6. <i>Euryscapus saltator</i> , Lind. |
| | 7. <i>Platygaster?</i> sp. |

The Russian species he tabulates as follows:—

1. Winged.
 - a. From one to four joints of the flagellum narrowly annular.
 - * Flagellum nine-jointed *Semiotellus? nigripes*.
 - ** Flagellum ten-jointed.
 - a. Antennæ with a distinctly two-jointed club *Tetrastichus Rileyi*.
 - β. Antennæ not clavate.
 - Flagellum with one annular joint *Eupelmus Karschii*.
 - Flagellum with two annular joints *Merisus intermedius*.
 - b. No narrowly granular joints in the flagellum *Platygaster minutus*.
2. With rudimentary wings } *Merisus intermedius*,
var. *microptera*.
3. Wingless *Euryscapus saltator*.

Merisus intermedius is so called because it appears to be intermediate between the two American species *M. destructor* and *subapterus*, which were formerly regarded as forming one species. Its colour is metallic green; the antennæ of the male yellow, of the female brown; legs yellow, with the coxæ, and sometimes also the femora, black; under surface of abdomen often reddish brown, especially at base. Both male and female may have stunted wings, but these are longer than in *M. subapterus*, and show venation. Length 2 millim. The species appears to be very abundant in all parts of Russia, and seems to have two generations in the course of the summer.

Tetrastichus Rileyi is rather less than 2 millim. long; black, with a blue or green lustre. Antennæ blackish brown; legs yellow, with the tips of the tarsi dark; abdominal segments densely hairy, especially towards the apex. *Tetrastichus productus* is regarded by Riley as a parasite of *Merisus*; the author has been unable to arrive

† "On the Parasites of the Hessian Fly," in Proc. U. S. National Museum, vol. viii. (1885) p. 413.

at any conclusion as to whether his species is a primary or secondary parasite of the Hessian fly.

Semiotellus (?) *nigripes* is a form which does not appear to have its representative in North America. It has a strong green, or sometimes blue, metallic lustre, the antennæ and legs black, the latter with greenish lustre, the tarsi pale yellow at the base. Length 2 millim. The species is widely distributed in Russia. It appears to be single-brooded, emerging in July and August.

Eupelmus Karschii is black with a green or blue lustre; antennæ black; legs yellow, with the tips of the femora and tibiæ and the last joint of the tarsi black. In the female the fore legs are entirely yellow. Length under 2 millim. The American species is recorded by Riley as a parasite of *Isosoma hordei* and *I. tritici*.

Platygaster minutus.—Length $\frac{1}{2}$ millim. Black, shining, but with no metallic lustre. Legs yellow, with black femora, and the posterior tibiæ black; wings large, extending far beyond the tip of the abdomen, veinless, but hairy; femora much thickened in the middle, tibiæ in their lower half. The species seems to be abundant. The author regards it, as also the much larger American *P. Herrickii*, as a direct parasite of the larva of the Hessian fly, and not as parasitic in the egg; he always reared it from the puparia, and obtained from four to eleven individuals from a single puparium.

Euryscapus saltator is wingless, black, with a green lustre on the head and thorax, and frequently a brownish spot on each side of the mesonotum. Abdomen black with a faint greenish lustre; legs yellow, with the femora, the middle of the tibiæ, and the tips of the tarsi rather darker; first segment of the abdomen reddish brown; ovipositor yellow with the tip black; scape yellowish brown; flagellum black or dark brown, with a greenish lustre on the first two joints. Length 2 millim. The author has bred this species from puparia of the Hessian fly and also from galls of *Isosoma hordei*, but it does not seem to be abundant.

A single specimen of a seventh species has been obtained by the author. It appears to be a *Platygaster* of about the same size as the one already noticed, black, with yellow legs and brown antennæ, which have a large black club; the wings are as in *Platygaster*.—*Bull. Soc. Imp. Nat. Moscou*, 1887, no. 1, pp. 178–192.

On the Power of Multiplication of the Infusoria Ciliata.

By M. E. MAUPAS.

The author notes that the power of multiplication of the Ciliata depends upon three factors, namely:—1, the quality and abundance of food; 2, temperature; 3, the biological adaptation of each species as regards alimentation. The third factor alone varies for each type, the organization of the buccal apparatus determining the kind of food necessary, and rendering the animalcules herbivorous, carnivorous, or omnivorous.

Cryptochilum, *Paramacium*, *Colpoda*, *Tillina*, *Colpidium*, and the Vorticellidæ are herbivorous, living almost exclusively upon Schizomycetes and small zoospores. These Infusoria are great purifiers of